centrifuge **B4.12**

OPERATING and SERVICE MANUAL

Ref. No. 85540114

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CAREFULLY READ THIS MANUAL BEFORE OPERATING YOUR INSTRUMENT.

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CENTRIFUGE mod **B4.12**

serial No.

WARNING: to avoid damaging the centrifuge and the rotating equipment by potential operator errors or mishandling of the unit, we strongly recommend that you read the operating instructions carefully before starting a centrifugation operation.
The protection degree of the B4.12 centrifuge is IP20 (CENELEC HD 365); therefore it is not certified for use in explosion risk areas.

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1. SAFETY

1.1.Manufacturer

The B4.12 centrifuge is manufactured by A.L.C. Apparecchi per Laboratori Chimici, Via Jean Jaurès,12 - 20125 Milano - Italy.

1.2.Safety regulations

This centrifuge complies with the following standards: CEI 62-25 (Electrical Laboratory Equipment for Clinical Tests), IEC 62D (Secretariat 12), ESCHLE (H.E.I. N.158/8/86), act 1/3/68 N.186 and D.P.R. 27/4/55 N.547.
Class 1 equipment - Ambiental temperature 10C-40C.
Degree of protection: IP20 (CENELEC HD 365) R.F.I. Suppression: CISPR N.29, N.33-VDE 0875.7.71
In order to ensure both mechanical and electrical operational safety, the centrifuge is provided with the following safety control systems:

1.2.1. The centrifuge will not start unless the lid is locked; the lid cannot be opened during centrifugation, even in the event of power failure.

1.2.2. Safety electronic circuits for self-diagnosis; any possible breakdown of the circuits which control the various functions (tacho, cover, current) is shown on the display and neutralized at the same time, preventing unsafe operating conditions of the machine.

1.2.3. Safety device, with electronic accelerometrical load imbalance sensor, that switches off the centrifuge before dangerous vibrations may develop.

1.2.4. Double metal protection casing for the rotating equipment; extractable stainless steel centrifugation chamber, outer casing made of sheet iron.

1.2.5. Bench top protection against accidental spillings.

1.2.6. Lid antifall device.

1.2.7. Low voltage control elements and circuits, with insulation of the mains through a transformer (cold side earthed, hot side protected by a service fuse).

1.2.8. Double mains fuses accessible only when power is excluded.

1.2.9. Normalized filters to avoid radiations and R.F.I.

1.2.10. High quality electric and electronic components, selected before assembly. Direct current electric motor with permanent magnets and no winding for a higher insulation effectiveness.

1.2.11. Individual certified tests for each machine, with measurements and testings of the leakage currents, the earth connection resistance and the applied tension.

1.2.12. Self-certification, identification plates, operating instructions and construction specifications available on request to qualified offices and personnel.

Note. As this centrifuge does not conform with anti-deflagration standards, it should only be used in explosion proof areas. Furthermore as the tubes cooling is obtained by the ambient air circulation in the centrifugation chamber, through special ducts,the centrifuge should not be operated in dusty areas or in the presence of vapours of corrosive or dangerous substances.

2. CHARACTERISTICS

2.1. Dimensions Weights

HeightxLengthxWidth	34.5x40x45 cm
Packing HxLxW	46x41x50 cm
Net weight	32 kg
Weight with packing	35 kg

2.2. Centrifugation characteristics

Max allowable capacity (4x135 ml) $540x10^{-6}$ m^3
Max allowable density 1300 kg/m^3
Max allowable weight 0.702 kg
Max speed 6000 rpm
Max RCF at tip 3567 xg
Max kinetic energy 2.4 kN.m

2.3. Electrical characteristics

Nominal operating voltage 220V 50Hz
Nominal power consumption 500 VA

2.4. Specifications

- Digital time setting 1 ÷ 99 min (1 min steps + ∞)
- Digital speed setting 300 ÷ 6000 rpm (10 rpm steps)
- Digital speed reading 0 ÷ 6000 rpm (± 10 rpm)
- 3 position electrodynamic brake: off-low-high
- Direct driving system with permanent magnet motor
- Air-cooling of the centrifugation chamber through CWS® (cool working system).

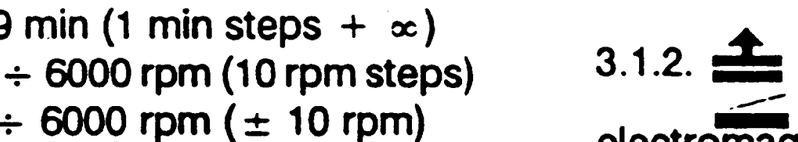
3. DESCRIPTION

The B4.12 centrifuge has a sheet iron case, varnished with epoxy powder. The stainless steel centrifugation chamber is extractable both for easy cleaning and for inspecting the motor carbon brushes and the service fuse.
The d.c. motor has a p.m. field which greatly reduces heat and insulation problems; it is mounted on an antivibration support stabilized by a suitable mass which makes it stand imbalanced loads, within certain limits, without suffering or causing damages.
The air-cooling of the centrifugation chamber and of the motor is ensured by the 'CWS' system. This system is capable of considerably increasing the air exchange with the exterior of the chamber and of cooling (in intake) the motor according to the supplied power.
The lid is provided with two locking hooks and with a safety device which allows opening only when the machine is stationary. Whilst the centrifuge is running it is not possible to open the lid even in case of power failure.

The rotating heads supplied with the machine are interchangeable and can be of the following types:
O - (Oscillating) with a swing-out angle for the tubes, from 0 to 99.
F - (Fixed angle) with a fixed inclination angle for the tubes;
A - (Aerodynamic) with direct housing of the tubes in the conical shapedhead, at a fixed inclination angle.

3.1. Operator panel - Control board

3.1.1. **POWER** - Illuminated mains bipolar switch.

3.1.2.  Press button to unlock the lid through the activation of the unlocking electromagnet; the warning light appears only when its function is automatically possible, that is when the machine is stationary.

3.1.3. **Set RPM** - Digital speed set: the desired value is selected and displayed by adjusting the 10 turns control knob, holding the button pressed.

3.1.4. **RPM** - 4 digit display 0-6000 rpm; permanently displays the centrifuge real speed and, by pressing the 'set RPM' button, the preset value.

3.1.5. **MIN** - Digital electronic timer from 0 to 99 min, with 1 min steps and continuous run position 00 = ∞ ; the 'timer on' intermittent warning light shows the current counting.

3.1.6. **BRAKE** - To insert and commute 2 braking levels plus the inertia stop: 'high'- high braking torque, 'low'- low braking torque, 'off' - inertia stop.

3.1.8. **tach-cover-motor** - break down warnings of the respective functions, with sudden machine stop.

3.1.9. **Start-Stop** - Switches allowing a completely automatic use of the centrifuge and the rotation voluntary stop.

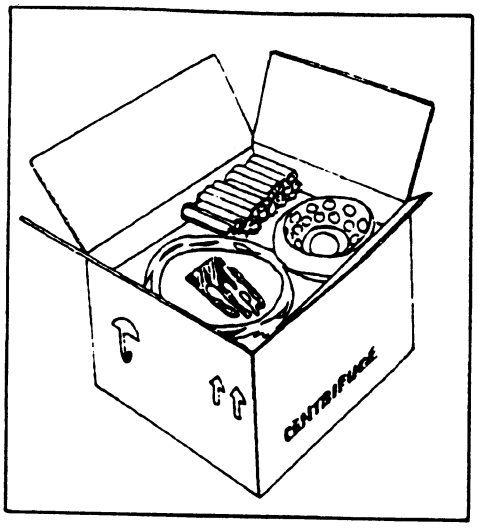


fig.1

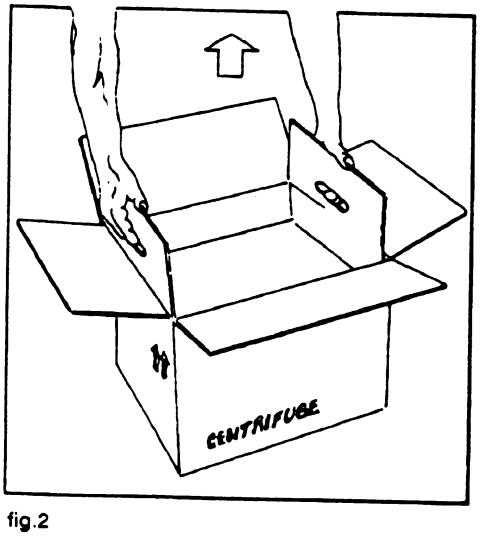


fig.2

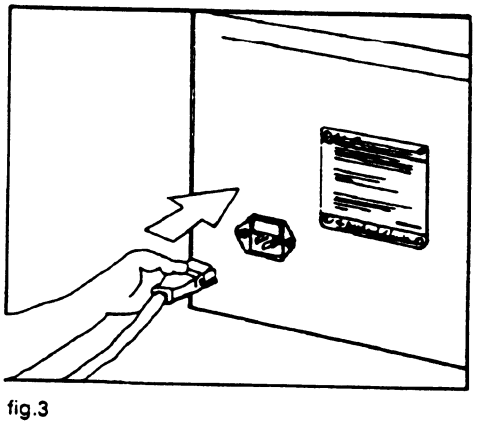


fig.3

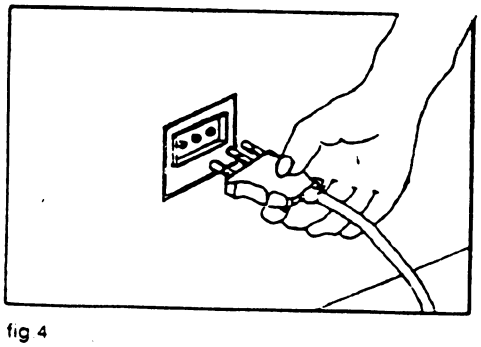


fig 4

4. INSTALLATION

4.1. Transport and Packaging

During transport the centrifuge is seated in a special packaging, separating, for safety reasons, the machine from the rotating equipment. Unpack the centrifuge, carefully removing first the rotating equipment, any possible accessories and the material supplied for ordinary maintenance (fig.1). Finally extract the centrifuge from the packaging (fig.2).

Keep the packaging until the centrifuge has been tested.

4.1.1. The general conditions accepted for the centrifuge transport and storage are (reference to CEI regulations 62- 25,2.4.4. and for no longer than 15 weeks):

a) ambiental temperature -40°C +70°C

b) relative humidity up to 100% excluding moisture formation.

4.2. Installation

Place the centrifuge on a bench top which must be rigid and sufficiently strong.
Important: the temperature of the centrifugation samples depends on the ambiental temperature and on the (ΔT) increase determined by the air friction on the rotating equipment; it is therefore advisable to avoid positioning the centrifuge close to heat sources.

4.3. Mains Wiring

Connect the centrifuge to the mains introducing first the input cable point in the socket plug in the machine back panel (fig.3); then insert the cable plug into a 120V/60Hz mains socket (fig.4).

Check that the centrifuge is effectively earthed.

Warning: the centrifuge is provided with R.F.I. filters; through lack or interruption of the protection cable, the user could receive a dangerous electric shock (CEI 62-25/2.4.3.2).

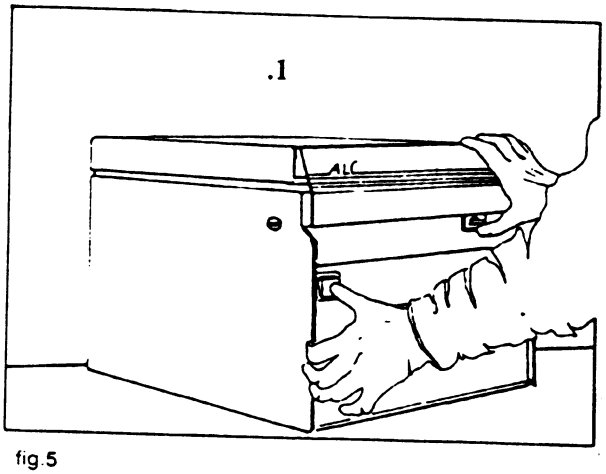


fig.5

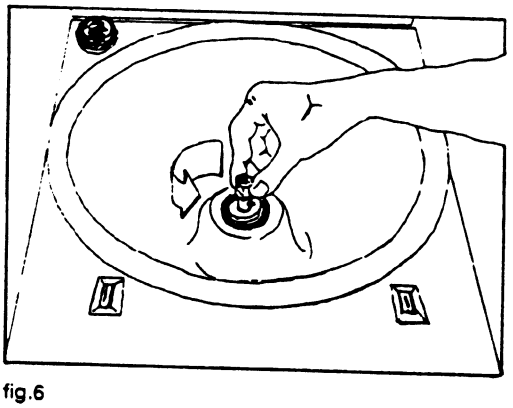


fig.6

4.4. Cover Unlock

1. Press the POWER switch: the mains green warning light and the lid opening yellow light will go on.

2. Press with one left hand finger the button ▬ (the electrolock will be heard clicking), then holding it pressed, lift with the right hand (following the direction of the arrow), the opening black lever: the lid will unlock with the help of the lid fall preventing spring (fig.5).

Warning: before proceeding to the installation operations, it is advisable to disconnect the centrifuge from the mains, by pressing the POWER switch button.

4.4.1. After opening the lid, remove any possible packing around the driving spindle. Carefully clean the inside of the centrifugation chamber removing any packing residues. Due to the air-whirling, solid particles accidentally left in the centrifugation chamber, would create an excessive wear of the chamber itself and of the outer bucket bottoms.
Unscrew the hexagonal nut locking the motor propelling spindle and put it away together with the rotating equipment (fig.6).

4.4.2. Check that the power unit is free to oscillate.

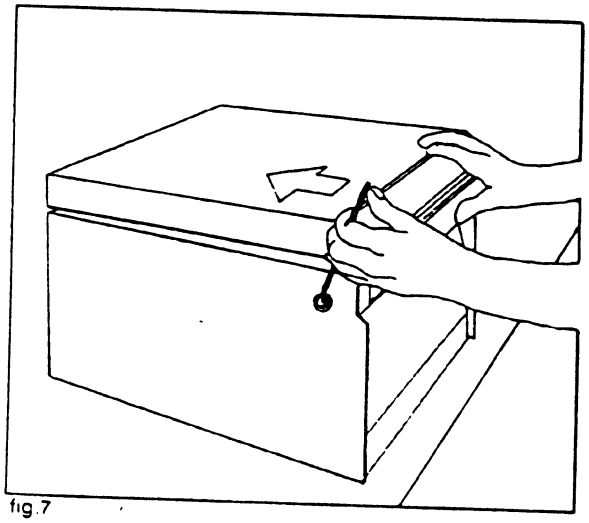


fig.7

4.5. Emergency cover unlock

In the event of mains non-availability or electricity failure, the lid can be opened using the special tools supplied with the centrifuge.

This operation should always be effected with the centrifuge mains plug disconnected.

1. With a wide tip screw driver or a coin, unscrew the protection cap on the left side of the centrifuge (fig.5.1).

2. Insert the hexagonal key supplied in the emergency device, uncovered by removing the protection cap; then unlock the lid, by turning the key counterclockwise (fig.7).

At the end of the operation screw the protection cap back.

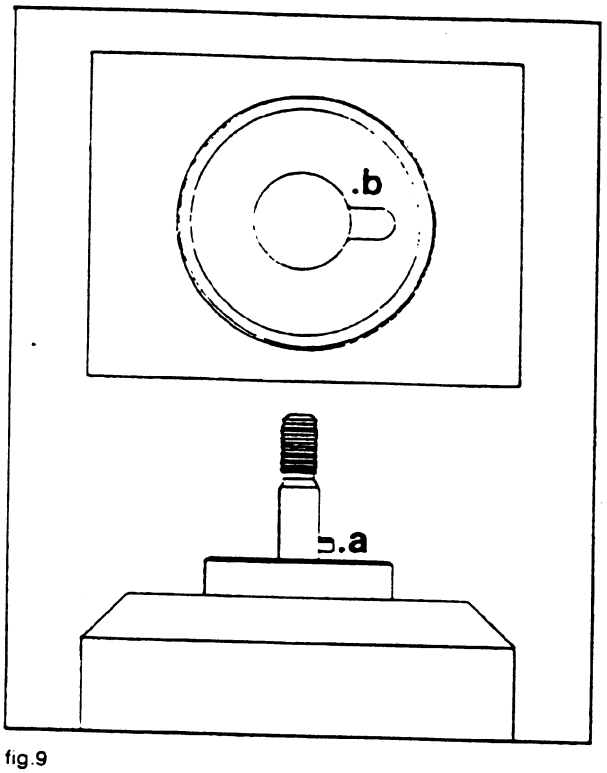


fig.9

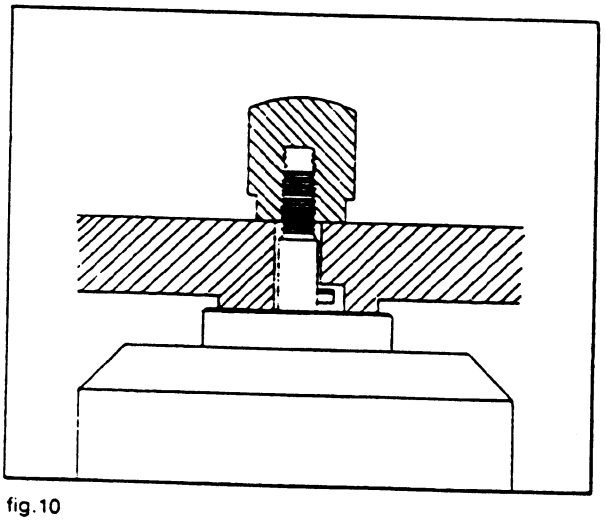


fig.10

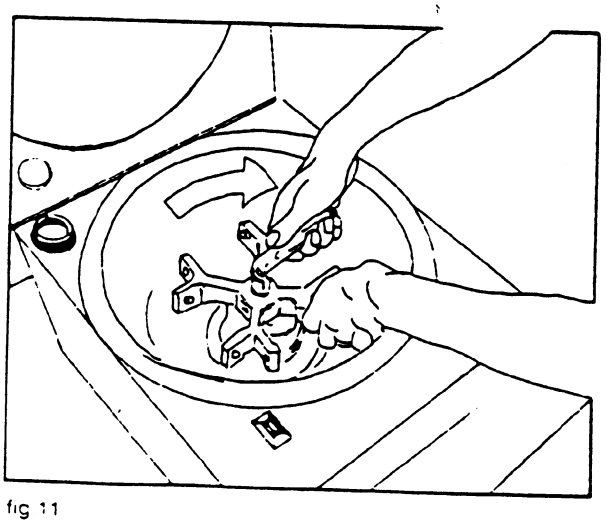


fig 11

4.6. Rotating head assembly

The driving of the rotating head by the power unit is obtained by fitting a small key, fixed on the driving stud, into a slot at the edge of the central hole of the head.

1. Make sure that the driving stud and the rotating head hole are clean.

2. Slip the rotating head on the driving stud (fig.9.a), with the slot (fig.9.b) facing down.

3. Match the slot with the driving key on the spindle just outside the ball bearing (fig.10).

This operation should be effected with great care.

4. Screw and moderately tighten, with the supplied key, the head locking hexagonal nut (fig.11).

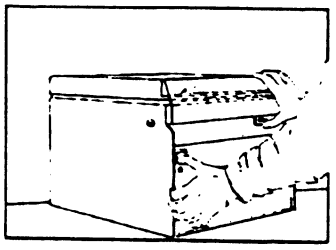
5. OPERATION PROCEDURE

5.1. Power switch - Cover unlock

Check, on the centrifuge back panel, that the input cable point is correctly inserted in the machine socket plug.

After switching the centrifuge on, by pressing the mains POWER (both green and yellow lights go on), press with one left hand finger the button (the electrolock will be heard clicking); then, holding it pressed, lift, with the right hand (following the direction of the arrow) the lid opening black lever: the lid will unlock with the help of the lid fall preventing spring (fig.5).

fig.5



5.2. Loading the rotating equipment

5.2.1. All rotating heads are dynamically balanced at source; reference numbers and marks indicate the exact respective positions of the various parts forming the equipment; when rotating this should always be whole and complete: rotating heads with buckets, aerodynamic rotating heads and rotating bowls with buckets.

5.2.2. In the load balance operation, the buckets should never be weighed, but only their contents (adaptors, tubes, etc.) placed at 180 from the rotation axis (fig.12.a.b).

5.2.3. Distribute the load correctly. Loads should be inserted two by two, of equal weight, at 180 from the rotation axis; they should also have equal distance (radius) from the centre (fig.12 a.b).

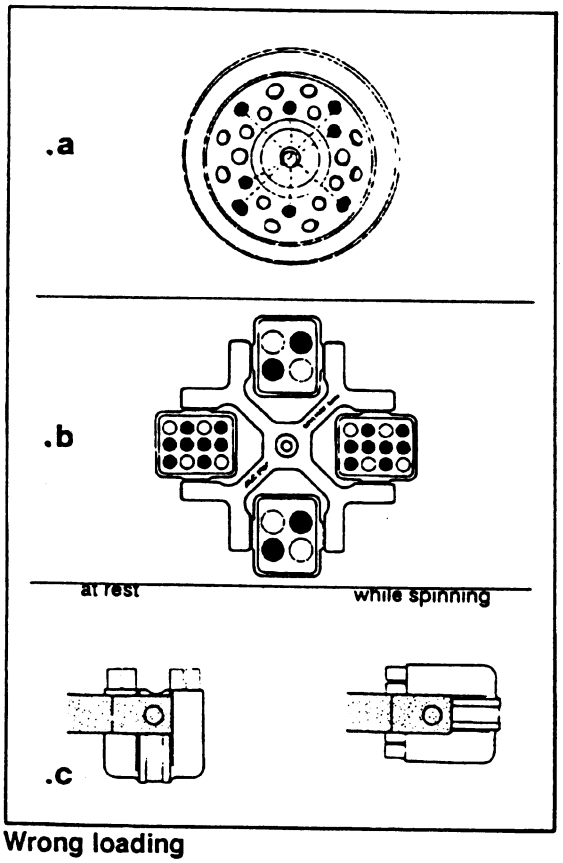
5.2.4. For partial loads of swing out rotating equipment (type 0) it is advisable to distribute the tubes symmetrically also regarding the swing spindles (fig.12.c), avoiding incorrect distribution (fig.12.d.e).

5.2.5. Avoid overloading the rotating equipment: Having to centrifugate liquids with higher density than 1300 kg/m3, the max speed should be reduced according to the following formula:

$$\text{allowed rpm} = \text{max rpm} \sqrt{\frac{1300}{\text{New Density}}}$$

5.2.6. Lower the lid , then close it pressing on the front edges until the hooks in the lid click into the machine body. Only this operation will activate the centrifuge starting device.

Correct loading
Distribuzione corretta del carico



Wrong loading
Distribuzione scorretta del carico

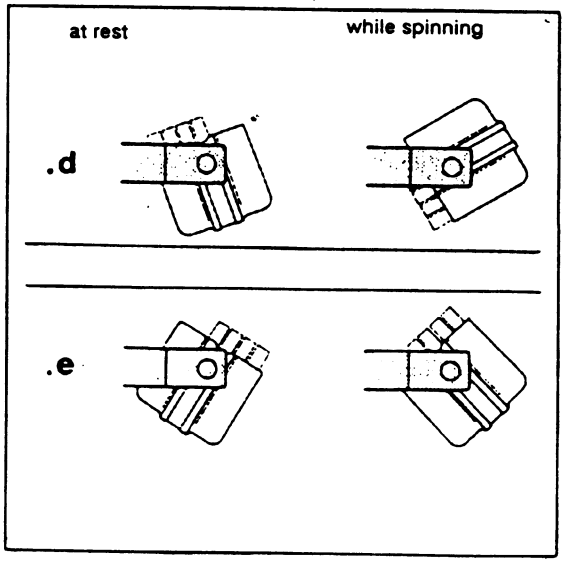


fig.12

5.3. Speed set - Centrifugation time set - Start

The machine should be idle:

1. Holding the 'set SPEED' button pressed, turn the respective knob until the desired speed appears on the 'rpm' display (from 300 to 6000 rpm with 10 rpm steps). At any time, even during operation, it will be possible to check the set speed, by pressing the 'set RPM' button and, if necessary, modify it through the knob.

IN NO CASE SHOULD A HIGHER SPEED BE SET THAN THE ONE SHOWN IN THE 'rpm max' COLUMN OF THE ROTATING EQUIPMENT TABLE

The max rpm printed directly on the rotating head are sometimes higher than the ones shown on the tables; this is due to the fact that the same equipment can be used on centrifuges with different power and performances and the printed speeds are the maximum limit that can in no way be exceeded by the rotating equipment.

2. Set the centrifugation time from 1 to 99 min through the TIMER digital preselectors; with 00 setting the centrifuge is running continuously. These operations should be performed when the machine is stationary. During the run, the 'timing on' flickering light indicates that the electronic timer is in function.

3. Press the 'START' button for the automatic start of the centrifuge; after the acceleration stage, the machine will settle on the set speed.
The 'rpm' 4 digit display indicator will always show the real rotation speed.

5.4. Stopping the Centrifuge

Position the 'BRAKE' commutator on the desired type of stop:
off - inertia stop
low - slow brake (with low braking torque)
high - quick brake (with high braking torque)

After the preset time the centrifuge stops automatically with the preselected type of braking: off-low-high.
To anticipate stop or in case of continuous running, press the 'STOP' button.

It will be possible to open the lid again when the lid opening warning light goes on, that is when the machine is stationary.

5.5. Stop for imbalanced load

In case of excessively imbalanced load (still at low speed), the centrifuge will automatically stop, warning the operator through an intermittent buzzer sound.

Proceed as follows:
1. Press the switch 'POWER', disconnecting the machine, then press it again to switch the machine on; the acoustic alarm will stop.
2. Open the lid and remove the imbalance cause (see 5.2).
3. Repeat the starting operation (see 5.3).

[A] Alarms
In the event of break down, the warning lights 'tacho', 'cover', 'current' indicate the failing function and warn, at the same time, about the stopping of the machine run (see 9.1).

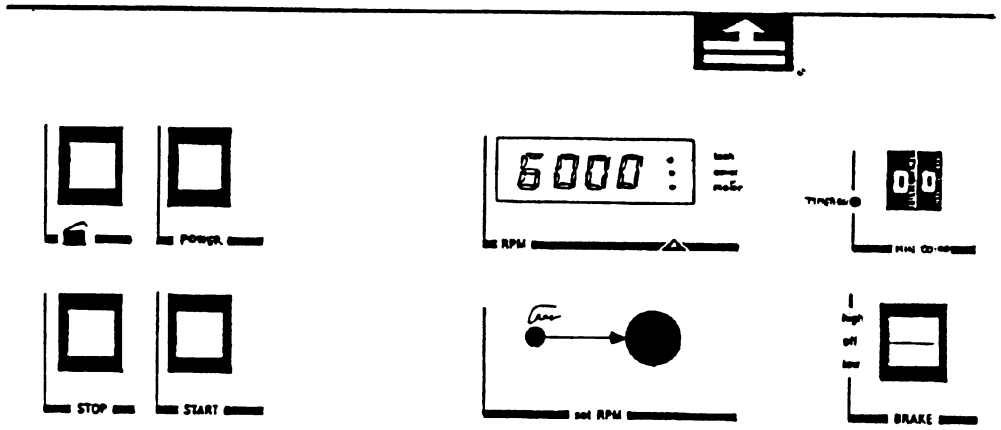


fig 13

6. DANGEROUS OPERATIONS - WORK CONDITIONS TO AVOID

6.1. *Using the centrifuge in explosion risk rooms or with explosion risk products.*

6.2. *Incorrect assembly of the rotating head on the drive stud.*

6.3. *Imbalanced load causing an eccessive vibration of the centrifuge.*

6.4. *Moving or shifting the machine during centrifugation.*

6.5. *Exceeding the maximum speed indicated in the 'max rpm' column of the performance table (see 7.1.2).*

The max rpm printed directly on the rotating heads are sometimes higher than the ones shown in the tables; this is due to the fact that the same rotating equipment can be used on centrifuges with different powers and performances; the printed speed is the maximum limit which can in no way be exceeded by the rotating equipment.

6.6. *Centrifugating samples with higher density than 1300 kg/m^3 at maximum speed (fig. 5.2.5).*

6.7. *Manipulating and/or tampering with the electronic or mechanical parts, on the part of unskilled personnel.*

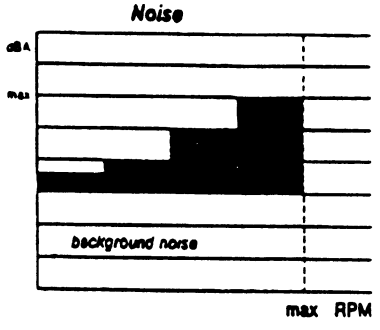
7. ROTATING EQUIPMENT

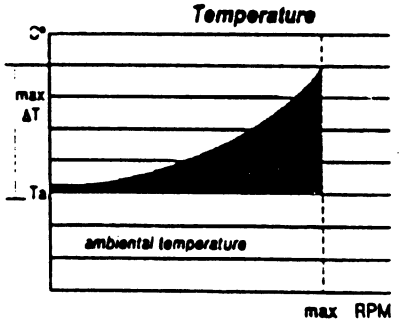
7.1.Equipment table - performance

7.1.1 ***Equipment table***

equipagg. tipo *type of equipment*	composizione del carico - *load composition*		testa rotante *rotating head cat. No.*	porta provette *bucket cat. No.*	anello di basc. *trunnion cat. No.*	raggio utile max *useful max radius m*
	α	capacità *max capacity*				
0-24/1	0÷90°	4 x 135 ml	T111	P106	–	0,150
0-24/2	0÷90°	4 x 135 ml	T111	P108	–	0,150
0-1	0÷90°	4 x 135 ml	5883	5782	–	0,149
0-1/1	0÷90°	4 x 135 ml	5883	6060	–	0,149
0-2	0÷90°	16 x 15 ml	5883	3195	5710	0,146
F-1	45°	6 x 80 ml	5233	5011	–	0,118
F-2	40°	30 x 15 ml	5513	3195	–	0,135
F-3	45°	24 x 15 ml	5228	3195	–	0,130
F-4	45°	12 x 15 ml	5227	3195	–	0,115
A-10	45°	60 x 0.5 ml type Beckman	6064	–	–	0,081
A-12	45°	20 x 2 ml type Eppendorf	6065	–	–	0,078

Operating characteristics diagram





7.1.2.Tabella prestazioni - ***Operating characteristics***

equipagg. tipo *type of equipment*	*max RPM*	*max RCF* xg	*max ΔT* °C	*max dBA*	*max kinetic energy* kN·m
0-24/1 0-24/2	4000	2683	4	61	2.4
0-1 0-1/1	4500	3373	1.5	66	1.9
0-2	4100	2743	2.5	61	1.5
F-1	5200	3567	1	56	2.1
F-2	4300	2790	3.5	59	2.4
F-3	4500	2943	3	57	1.9
F-4	4900	3086	2.5	58	1.1
A-10	6000	3260	4	51	1.1
A-12	6000	3139	4	51	1.1

7.2. R.C.F. Calculation

The main factors of the centrifuge action in terms of correct analysis methodology are: the centrifugation time and the gravity number "xg" (relative centrifuge acceleration) to which the product is submitted.
The graph on the previous page allows the determination, as a function of the radius "r", of the relative centrifuge acceleration value, expressed in multiples of the gravity acceleration value g (9.8 m/sec) for each rpm value between 150 and 20000.

EXAMPLE

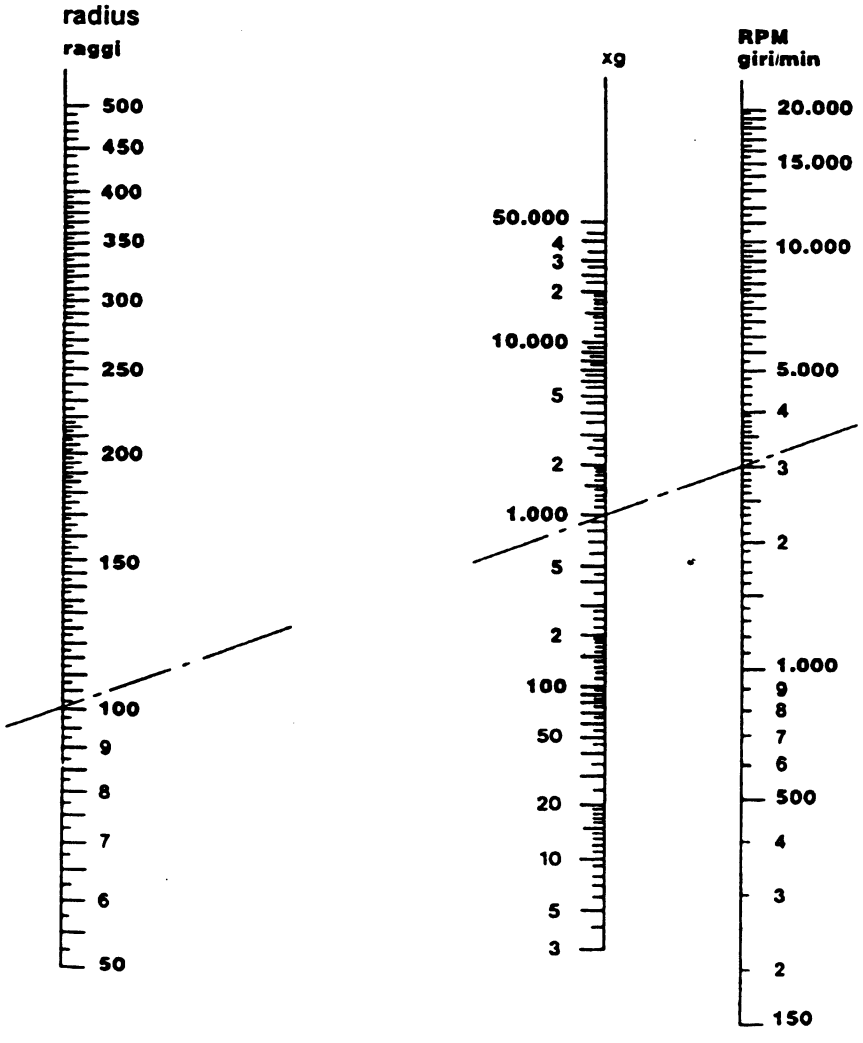
To find the relative centrifuge acceleration value xg of a point at a 100 mm (0.1 m) distance from the rotation axis and rotating at 3000 rpm, place a ruler on the radius scale on the left, joining the point marked 100 on the left scale with the one marked 3000 on the right hand scale of the rpm: the inserction of the central scale xg gives directly the required relative centrifuge acceleration value (in our case 1000 xg)

The relative centrifuge acceleration and the rpm number are connected by the following relations:

$$xg = 1.1178 \cdot 10^{-3} \cdot n^2 \cdot r$$

$$n = \sqrt{\frac{xg}{1.1178 \cdot 10^{-3} \cdot r}}$$

where: n = rpm r = radius in metres



8.1. Operational electric diagram

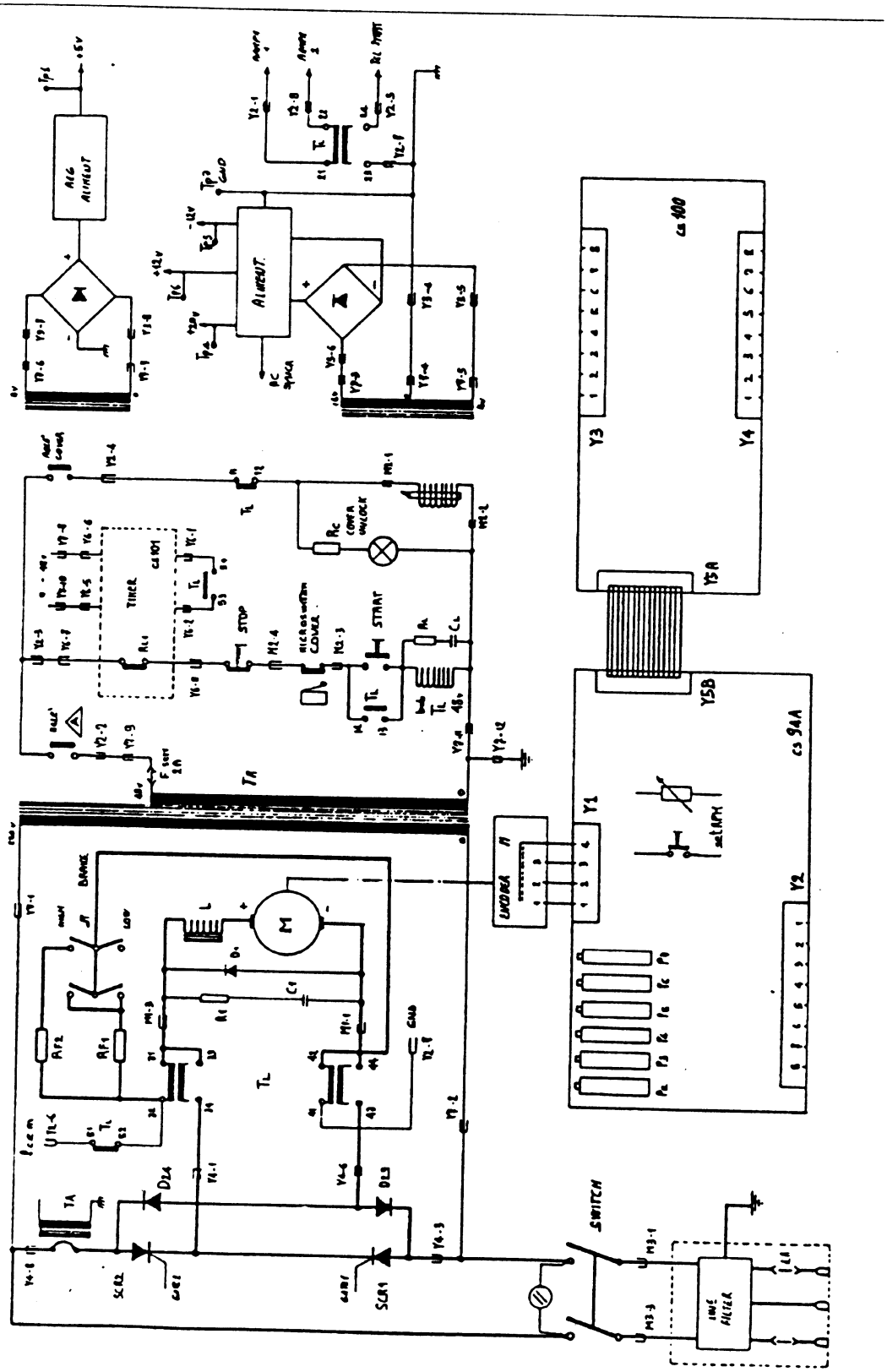


fig.14

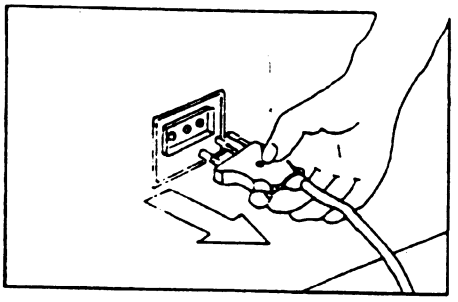


fig.15

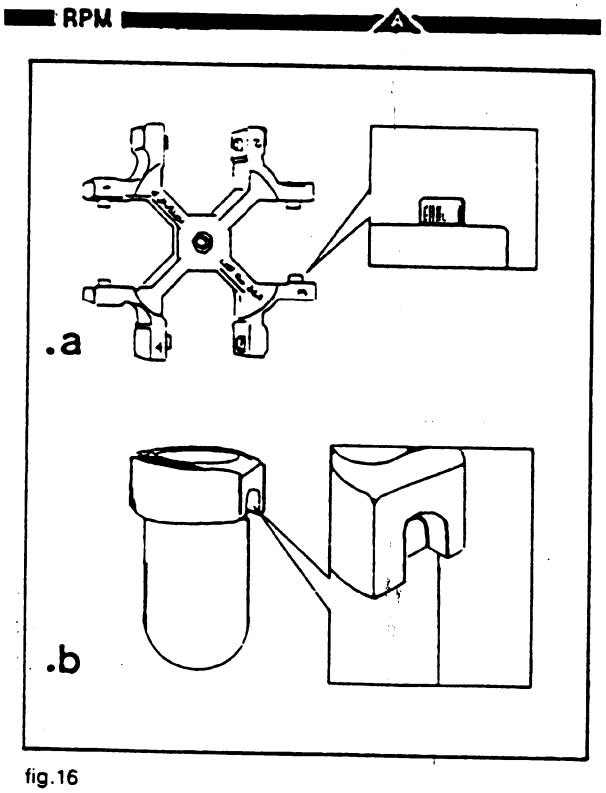


fig.16

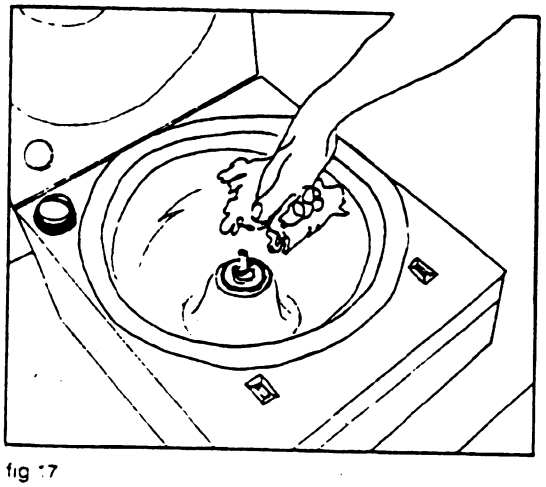


fig.17

9. SERVICES - MAINTENANCE

9.1. Trouble shooting

1. No power supply: check connections to the mains and mains fuses in the back panel (see 9.3.3).
2. Regular power supply - the machine does not work, after pressing 'START':

a. check cover-lock;
b. carefully repeat operations as in 5.3.;
c. check service fuse (see 9.3.5);
d. check and, if necessary, replace the motor carbon brushes (see 9.3.4.). In this case,whilst the machine is still stationary, the warning lights 'tacho' and 'current' go on (fig.15).

3. The machine starts, but stops after a few seconds and, at the same time, one or more warning lights ('tach'-'cover'-'motor') appear: the machine needs checking by a maintenance engineer. This will also be necessary in case of alarm sounds during centrifugation.

9.2. Speed control

Speed can always be checked, in any load and operation condition, by means of a stroboscopic RPM counter through the transparent cap in the centre of the lid.

9.3. Routine maintenance

9.3.1. Caution: always disconnect the mains during maintenance operations (fig. 14).

9.3.2. Rotation equipment and centrifugation chamber cleaning

Regular cleaning of rotating heads and centrifugation chamber is vital for correct work conditions of the centrifuge.

1. Remove adaptors from the buckets or from the aerodynamic rotating head slots; carefully clean the individual holes and the exterior parts to avoid scaling which would prevent the free extraction of the buckets and the swinging of the equipment even without load.

2. For the swing out rotating equipment it is important to clean periodically the rotating head studs and the bucket balancing slots (fig.16.a.b); after cleaning, smear the buckets with a thin layer of light grease.
Never apply grease if studs and balancing slots have not been carefully cleaned.
Once the rotating head has been removed it is easy to clean the centrifugation chamber (do not use corrosive solvents or detergents) (fig.17).

3. In the event of tube breakage, during centrifugation, chamber, rotating head and bucket balancing slots should be immediately cleaned, removing any glass or plastic splinters which may damage the surfaces exposed to air whirling during centrifugation.

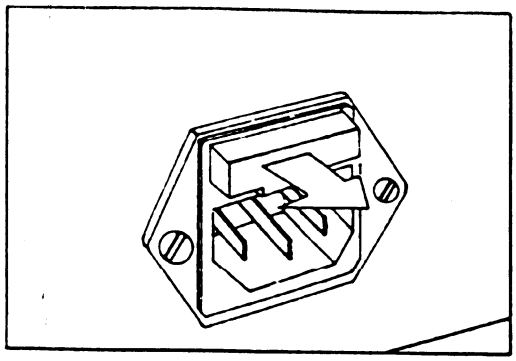


fig.18

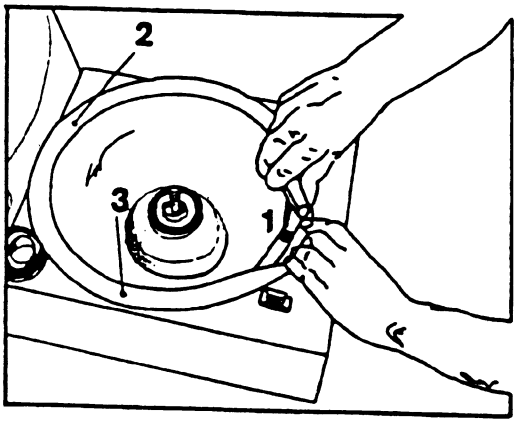


fig.19

fig.18

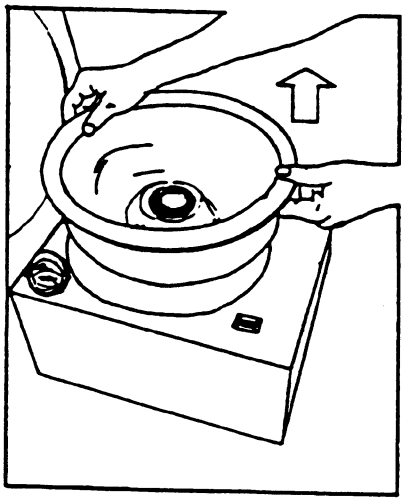
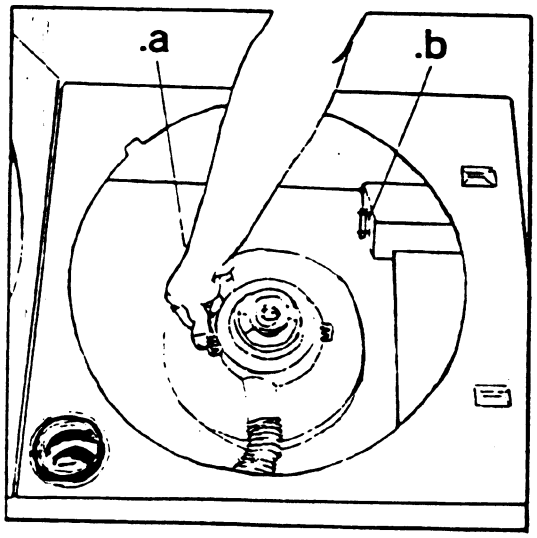


fig.20

fig.21



9.3.3. Mains fuses

Mains fuses are seated in the plug unit in the centrifuge back panel; they can be reached by removing the cable socket and the flash fuse case (fig.18).

Fuses dia 5x20 mm T6,3A

Should the fuses repeatedly blow, do not use more powerful ones; call for an assistance engineer.

9.3.4. Checking - replacing carbon brushes

The motor construction features ensure a considerable run-hour autonomy. Nevertheless it is advisable to check carbon brushes every 400 run-hours, replacing them if their length is less than 10 mm (initial length is 25 mm).

Warning: excessively worn out brushes, in addition to causing the centrifuge to stop, may damage the motor.

1. Open the lid

2. Disconnect the mains plug (fig.14)

3. Remove the rotating equipment

4. Loosen the three screws (covered by the gasket) fixing the centrifugation chamber to the machine (fig.19)

5. Remove the centrifugation chamber (fig.20)

6. Replace carbon brushes only with the ones supplied with the machine (fig.21.a).

Carbon brushes type **3860**

never use different quality carbon brushes

9.3.5. Service fuse

The service fuse that protects the centrifuge control circuits is seated in the transformer printed circuit. It can be reached by repeating the operations described in 9.3.4. from 1 to 5. The fuse holder will appear after removing the centrifugation chamber (fig.21.b).
Service fuse dia 5x20 mm 2A/250V

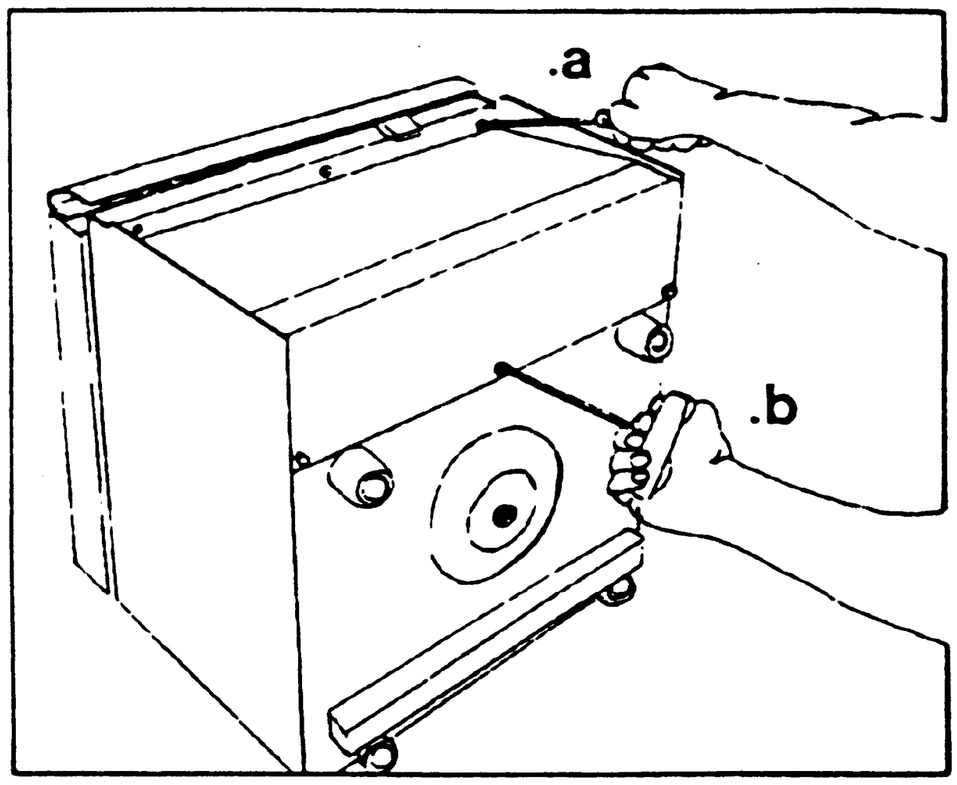


fig.22

9.4. Extraordinary maintenance

The extraordinary maintenance operations should always be carried out by qualified personnel and only after disconnecting the mains plug.

9.4.1. Electronic-accelerometric circuit to detect loading imbalance; setting of intervention threshold.

The circuit original setting is foreseen for the described work conditions: horizontal and sturdy centrifuge bench top, antivibration devices in perfect conditions, clean rotating head, etc.Should a readjusting of this setting be necessary, the control screw is accessible in the machine back panel (fig.23): clockwise rotation decreases imbalance sensitivity, whilst counterclockwise rotation increases it.

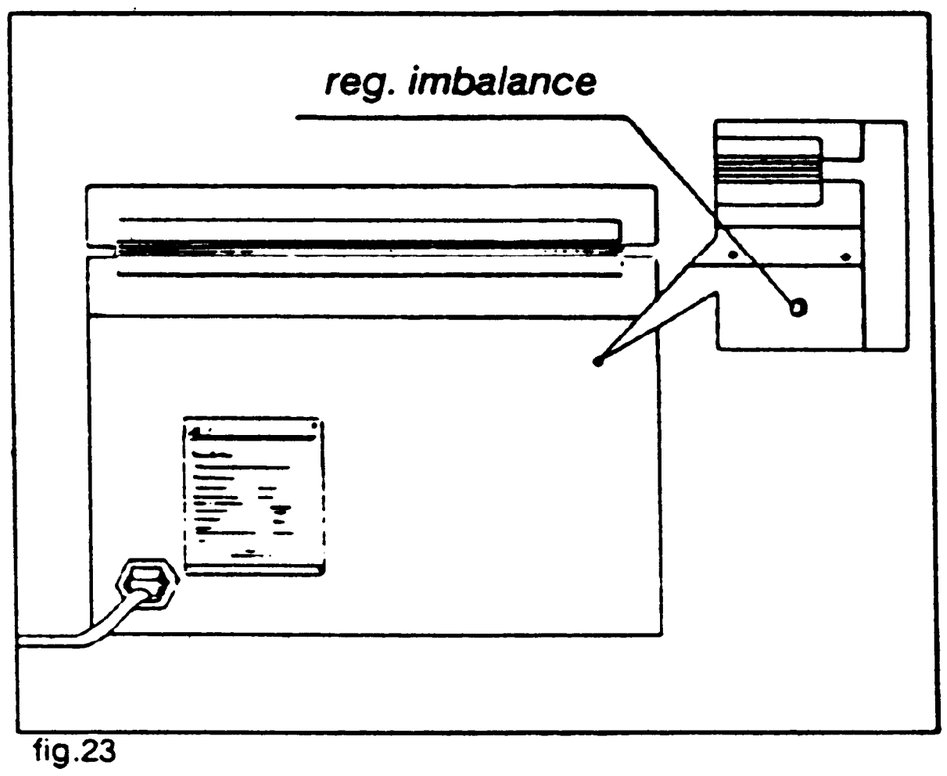


fig.23

9.4.2. Gaskets

Between lid and centrifugation chamber: type **4610**
Between centrifugation chamber and motor: type **3996**

To reach gaskets proceed as in 9.3.4.(1 to 5); then replace one or both gaskets.

Note: Make sure the motopropeller unit is free to oscillate.

9.4.3 Control board - Operator panel

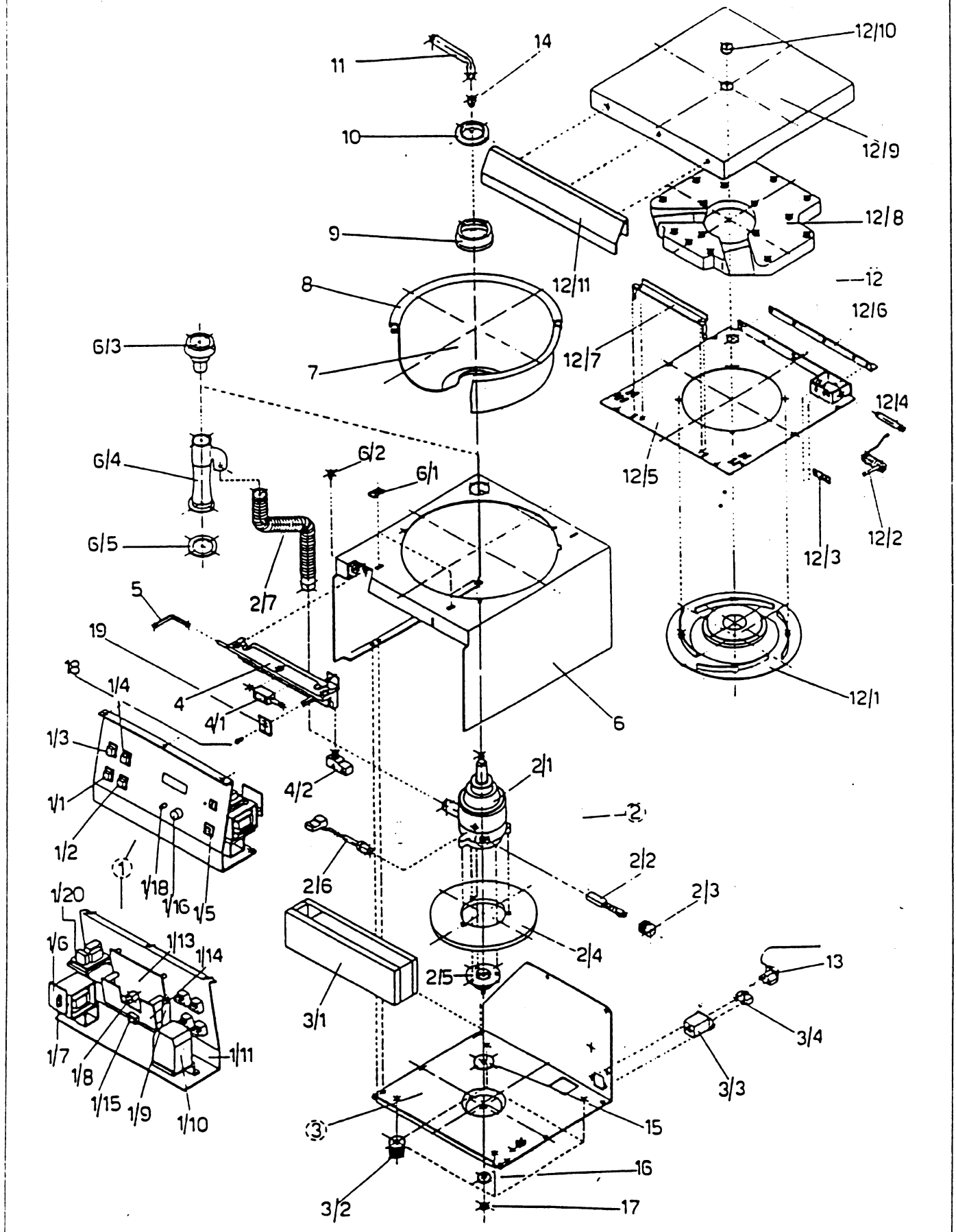
When checking or replacing panel components operate as follows:

1. Remove the rotating equipment
2. Lay the centrifuge on its back and loosen the 6 screws fixing the panel to the machine: 3 to the front and 3 to the bottom (fig.22.a.b).

3. Extract the control board-operator panel.

ASSISTANCE OPERATOR'S notes

Upon request ALC supplies specialized personnel only (hospital technical offices, maintenance engineers, etc.) with general and detailed wiring diagrams, setting data and all necessary information for a deeper technical knowledge of the unit.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64.12

Item	Cat.No.	Descrizione	Description	Qty
		CENTRIFUGE B4.12		
1	110050004235	Quadro comandi completo 220V 50/60Hz	Control panel ass.y 220V 50/60Hz	1
1	110055004235	Quadro comandi completo 120V 50/60Hz	Control panel ass.y 120V 50/60Hz	1
1/1	131101000040	Pulsante stop	Stop pushbutton	1
1/2	131101000030	Pulsante start	Start pushbutton	1
1/3	131101000020	Pulsante apertura coperchio	Cover unlock switch	1
1/4	131101000010	Interruttore linea	Mains switch	1
1/5	131001000010	Commutatore freno	Brake switch	1
1/6	1300500CS102	Scheda ass. + trasformatore 220V 50/60 Hz	Printed wiring ass.y + transformer 220V 5	1
1/6	1300550CS102	Scheda ass. + trasformatore 120V 50/60 Hz	Printed wiring ass.y + transformer 120V 5	1
1/7	05X20 2A	Fusibile	Fuse	1
1/8	131501000040	Potenziometro velocità	Speed potentiometer	1
1/9	100325000012	Resistenza freno 100 Ohm 25W	Brake resistor 100 Ohm 25W	1
1/9	100325000015	Resistenza freno 180 Ohm 25W	Brake resistor 180 Ohm 25W	1
1/10	131901000061	Teleruttore	Contactor	1
1/11	110001004656	Targa	Front panel	1
1/13	1300510CS94C	Scheda assemblata (velocità) 220V 50/60 Hz	Printed wiring ass.y (speed) 220V 50/60	1
1/13	1300550CS94C	Scheda assemblata (velocità) 120V 50/60 Hz	Printed wiring ass.y (speed) 120V 50/60	1
1/14	130050CA100B	Scheda assemblata (potenza)	Printed wiring ass.y (power)	1
1/15	134350000012	Cavo piatto	Flat cable	1
1/16	133201001041	Manopola velocità	Speed knob	1
1/18	131205000010	Cappuccio per tasto velocità	Speed pushbutton cap	1
1/20	1300500CS101	Scheda assemblata (timer)	Printed wiring ass.y (timer)	1
2/1	070502013582	Motore 220V 50/60 Hz	Motor ass.y 220V 50/60Hz	1
2/1	070502013639	Motore 120V 50/60 Hz	Motor ass.y 120V 50/60Hz	1
2/2	3860	Carboncino motore	Motor brush	2
2/3	065201000015	Tappo per portacarboncino	Brush carrier cap	2
2/4	015001003990	Massa stabilizzatrice	Stabilizer mass	1
2/5	3727/50	Antivibrante motore	Antishock motor isolator	1
2/6	106550004236	Gruppo sensore velocità	Speed sensor ass.y	1
2/7	032501000010	Condotto flessibile aria	Rubber tube	1
3	011001004677	Basamento	Bottom plate	1
3/1	032501004682	Marmitta fonoassorbente	Silencer	1
3/2	030002006014	Piedino in gomma	Rubber foot	4
3/3	133702000150	Gruppo presa-filtro-fusibili	Mains socket + filter + fuses	1
3/4	05X20 4AT	Fusibile 220V 50/60Hz	Fuse 220V 50/60Hz	2
3/4	05X20 6,3AT	Fusibile 120V 50/60Hz	Fuse 120V 50/60Hz	2
4	134310004236	Gruppo elettroserratura	Lid locking ass.y	1
4/1	108201000020	Elettromagnete	Solenoid	1
4/2	C4CZN	Microinterruttore coperchio	Lid microswitch	1
5	140001000005	Attrezzo apertura emergenza	Emergency opening tool	1
6	087501004679	Involucro	Casing	1
6/1	042006004787	Protezione cava gancio	Latch slot protector	2
6/2	051010004767	Vite protezione foro emergenza	Emergency protection hole screw	1
7	083002004952	Camera di centrifugazione	Centrifugation chamber	1
8	042001004610	Guarnizione camera-coperchio	Centrifugation chamber-lid seal	1
9	090005013184	Calotta coprimotore	Motor cap	1
10	042003004526	Guarnizione camera-motore	Centrifugation chamber-motor seal	1
11	140001000001	Chiave fissaggio testa rotante	Rotating head locking key	1
12	700030004236	Gruppo coperchio	Lid ass.y	1
12/1	082101013111	Sottocoperchio	Under lid	1
12/2	050620004695	Molla anticaduta	Spring	1
12/3	050602004706	Piastrina ferma molla	Spring's stop	1
12/4	050506004972	Perno guida molla	Spring drive pin	1
12/5	082001004673	Coperchio	Lid	1
12/6	039005004640	Cerniera inox	Stainless hinge	1
12/7	050625004716	Gancio coperchio	Lid latch	1
12/8	032501004693	Convogliatore	Air pipe	1
12/9	081002004674	Copricoperchio	Lid cover	1
12/10	050610004882	Oblò coperchio	Lid view port	1
12/11	052002004665	Barra apertura coperchio	Lid opening bar	1
13	133001000010	Cavo alimentazione (ITALIA)	Mains cable (ITALIA)	1

IMPORTANT MAINTENANCE INFORMATION

CENTRIFUGE ACCESSORIES

1. AVOID CORROSION: Centrifuge rotors and buckets may corrode as a result of:
   - 1.1 Marring of the surface finish
   - 1.2 Impact to the surface
   - 1.3 Centrifugation of corrosive products
   - 1.4 Centrifugation in a corrosive atmosphere
   - 1.5 Lack of periodic cleaning

WARNING: Corrosion of rotors and buckets may create a safety hazard, by weakening their structural integrity. Material loss from corrosion may result in an imbalance and cause vibration at high speed.

CAUTION: Corrosion appears, in its first stage, as white spots on the painted or anodized surface of the rotor or buckets. The most common chemical to attack aluminum is the chloride ion, present in solutions like ammonia salts.

CAUTION: If an ANTI-BACTERIAL DISINFECTANT is required for cleaning, Jouan Inc. recommends the following chemicals:
- 70% ETHANOL
- 05% PHENOL
- ORTHO PHENYL PHENOL
- FORMALDEHYDE
- GLUTERALDEHYDE

2. REGULAR CLEANING: Adherence to a regular program of rotor cleaning and maintenance will inhibit the process of corrosion.
   - 2.1 Weekly cleaning of rotors and buckets requires warm water and a mild detergent solution. Thoroughly dry the rotor and buckets in an oven less than 80 °C.
   - 2.2 Monthly cleaning involves the procedure described above, as well as application of a thin film of silicon grease to the rotor pins and the bucket shoulder that pivots on the pins. This silicon grease is supplied with the centrifuge accessory kit.

3. EMERGENCY CLEANING: After an accidental spill or tube breakage, immediately clean the rotor and buckets, as described in section 2.1.
   - 3.1 Insert cleaning is accomplished by lifting each segment of the insert and scrubbing with a bottle brush. Use only mild detergent solution and dry with a clean, absorbant towel.
   - 3.2 Cushion cleaning is required after spillage or glass breakage. Remove the cushion and clean thoroughly.

CAUTION: If an insert cushion cannot be thoroughly cleaned of broken glass, replace with a new cushion before re-using the insert.

REV: 0494

DECLARATION of CENTRIFUGE EQUIPMENT CONTAMINATION
- JOUAN, INC. -

Complete this form before sending centrifuge equipment to Jouan Service for repair. You must call Jouan Service at (800)621-2454 to get an RMA number. Please FAX This completed form to: Jouan Service at (703)869-8626, and attach the form to the equipment to be returned.

Prepare the centrifuge for shipment, as follows:

Warning: ***Always use the correct safety precautions when handling contaminated equipment. Cleaning the centrifuge reduces the levels of damaging and dangerous contaminants but does not eliminate the hazard.***

1. **Remove, clean and disinfect all bucket adapters, buckets, and the centrifuge rotor.**
2. **Clean and disinfect the centrifuge exterior, and rotor chamber interior.**
3. **Use a suitable shipping container to pack the centrifuge, taking special care to support the centrifuge's weight. Please, DO NOT use shipping peanuts!**

Condition of the Equipment	**Description of Centrifuge**
How long has the centrifuge operated?	Type/Model:
What applications?	Catalog No.:
	Serial No.:

Reason for return:

Has the equipment been exposed to the following:

Toxic	__Yes; __No	Biological hazard	__Yes; __No
Carcinogeni	__Yes; __No	Explosives	__Yes; __No
Corrosive	__Yes; __No	Radioactives	__Yes; __No
Flammable	__Yes; __No		

Other harmful substance __Yes; __No; If yes, explain:

Note: Equipment that has been contaminated by a biological, explosive, or radioactive substance will not be accepted without written evidence of decontamination!

List all substances, gases, & by-products that came into contact with the equipment:

Product Name*	Chemical Name*	Special Handling*	First Aid Requirement*
1.			
2.			
3.			
4.			

**** Attach MSDS sheet, or use the reverse side to provide additional details.***

Customer Contact:	Phone No. ( )
Company:	Date:
Address:	P.O. No.:
	RMA Number: